

Economic Empowerment in the Agricultural Supply Chains of Lesser Developed Countries

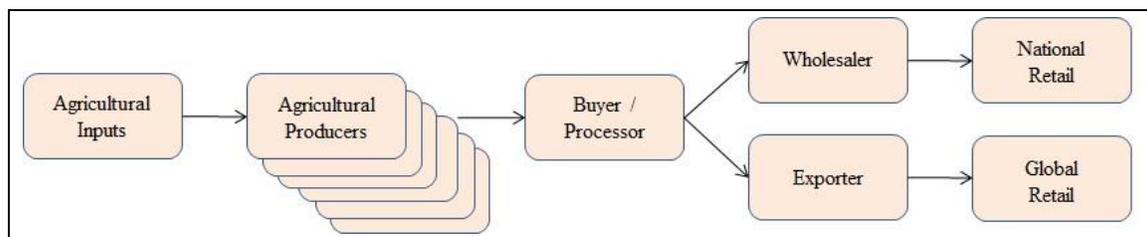
Throughout the developing world, subsistence agriculture and husbandry figure prominently among the poorest people. Many of these are trapped in regions with no resources, inadequate logistics infrastructure for accessing markets, or political systems dominated by poor governance and geopolitical instability. But even where this is not so, many farm communities are trapped in value chains that have commoditized their production at prices too low for economic sustainability. All the market power and most of the value accrue to downstream trading partners, leaving farmers as poor price-takers.

The solution is creation of new value chain intermediaries which 1) help the farmer enhance crop yield, 2) concentrate farmer production, 3) convert that production to intermediate or final goods having a higher contribution margin, 4) manage supply chain volatility, and 5) direct incremental value-added cash flow back to the farm community. These companies operate as social businesses whose capital is provided by non-traditional sources of aid purposed to long-term economic sustainability. [Coke 2012]

This paper elaborates how these value chain intermediaries use these methods to address issues of supply chain power.

Agricultural supply chain dynamics

Farming communities produce every agricultural commodity imaginable, in many different geographies and climates. But despite this variety, all share a common position at the first echelon of their supply chains. Their products are harvested and shipped either fresh to packagers or in bulk to processors. Both of these entities occupy the next level up in the supply chain, perform their value-added services, and add margin to the price. From there, products are further processed or distributed, locally or globally via export. Wholesale service companies at this echelon manage the logistics of delivery including transportation, customs clearance, tracking and tracing, and final good sale to retailers. They too charge a premium for their services, which is added to their commodity purchase price. Finally, the retailer stocks and sells the goods, typically doubling the wholesale cost to achieve a retail price.



In this typical value chain, contribution margins tend to rise as products get closer to the customer for two reasons. Scale of aggregation affords better purchase leverage, and proximity to the true demand signal conveys the advantage of avoiding inventory mistakes associated with the “bull whip” effect. Both serve as disadvantages for the farmer. The buyer purchases in bulk from many farmers giving the buyer a great deal of substitution price leverage. Additionally, the farmer has no visibility into the supply/demand balance of the channel and frequently harvests at the wrong time in his quest for a good price. When farmers see a high spot market price developing, they collectively rush to harvest, simultaneously offering too much inventory and crashing the price. Only the processors and importers have the infrastructure to balance supply and demand in the channel using inventory buffers and futures contracts.

Unless a widespread crop failure occurs or government removes a large portion of harvest from the market (as SE Asian rice producers did in 2008), farmers continue to earn some of the lowest contribution margins in the value chain. Individual farm output is too small to be a significant part of the commodity buyer’s business, ensuring the smallholder remains a price-taker.

The social business intermediary

To achieve market power, the farmer needs several capabilities:

- 1) optimize his seeding, cultivation, and harvest practices with better knowledge and inputs to achieve higher overall yield
- 2) consolidate his production with that of other farmers to achieve sufficient volume to impact buyer behavior
- 3) perform all reasonable product conversion at the point of harvest to earn maximum contribution margin
- 4) manage supply chain volatility through production and inventory planning coordinated with downstream partners

These can only be obtained through the creation of a new value chain intermediary having:

- access to government, academic, and other expertise helpful to the farmer (which may not be local)
- financial and other resources sufficient to own and manage inventory in the channel
- technologies for product conversion and packaging
- skills in planning, logistics, finance, contracting, quality assurance, compliance, etc.

To create sustainable communities, this intermediary must be structured as a profitable standalone business so that it can earn incremental value-added cash flow. As a social business, its retained earnings can be directed back to the farm community - both in the form of higher prices for farmed goods, and through investment in community medical, education, utility, and other infrastructure. We know the necessary contribution margin already exists in the channel because it is being earned presently by other for-profit intermediaries that exist for the financial benefit of private investors. All we are doing is migrating more of the wholesale goods price back up the value chain to the farmer community by reducing the *relative* market power of downstream echelon buyers.

At first glance the skills and resources required appear overwhelming for rural agrarian communities to master. Stated in general terms they are. But the reality is that communities managing only a handful of commodities in a discrete universe of potential supply networks need understand only a few supply chain principles relevant to their situation. The production and inventory planning described below can be done on a few tabs of one computerized spreadsheet. Drying fruit and husking seeds are basic conversion technologies accessible to virtually all communities, as are the packaging and labeling that is done in one format many times. The real effort is in setting up the processes and procedures the first time, and selecting local people (often women) with the ability and willingness to learn. Of course, the donors that make this possible will need to commit on-going mentoring and periodic interventions to help the local team cope with inevitable supply chain adjustments.

The following sections detail the services performed by the social business value chain intermediary.

Farmer outreach

A sizable portion of the world's research is devoted to agriculture, and farmers clearly benefit from the continuous improvements in methods and inputs. An important role of the value chain intermediary is meeting regularly with farmers, hearing about their experiences, and facilitating group learning about the latest findings from the world of agricultural research. This role supplements that of government extension services, which are often not very effective. In turn, the donors that oversee the intermediaries should facilitate continued exchange of best practice both among the intermediaries and with external researchers. There may be NGOs that can provide the required global extension service.

Most subsistence farmers use extensive farming techniques that minimize inputs like fertilizer and energy. They almost universally depend on physical rather than mechanized labor. As a result, yields are typically lower than is possible with more intensive farming. The intermediary can play a limited role here as well; providing seed, fertilizer, and tools in exchange for a quantity of future harvest.

An equally important role for the intermediary is inventory management. Farmers expect to be paid in cash for their crops when delivered based on seasonal harvests. But downstream buyers typically buy on credit spread out more evenly during the year. The difference between the two means inventorying materials that have been harvested but not yet purchased, and paying now for accounts receivable that will be received later. This requires both warehouse or silo storage space, and substantial inventory working capital. Only a sizable intermediary can qualify for the necessary financial credit.

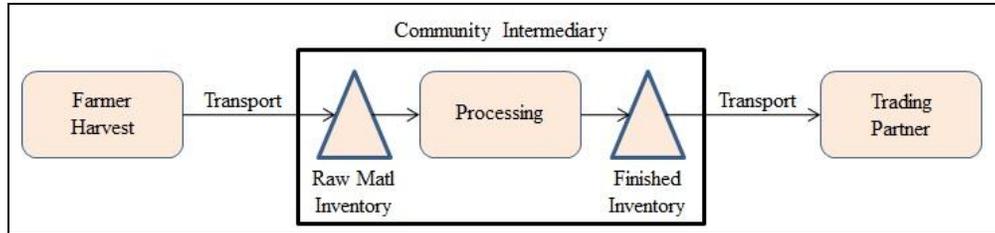
Value added processing

The intermediary is a value-added processor that purchases harvest from farmers and converts it into intermediate and final goods. It runs a manufacturing process that typically requires equipment, energy, transportation links, and other utilities. The availability of these resources will determine facility location, and can also determine what processing steps can be done near the farmer and what steps must be done elsewhere (potentially by a downstream trading partner). It is possible to scale down conversion facilities for small-batch distributed operation, and to use biomass waste and other materials as an energy source. It is sometimes surprising how much operational sophistication can be co-located with the farmer.

The intermediary notifies farmers in advance of its purchase plans so they can better plan their harvests, and all farmers are treated equally in terms both of price (subject to quality) and scheduling. The intermediary offers everyone the same price scale, in contrast to private buyers that sometimes pit one farmer against another to drive prices down. Farmers can elect to

reserve a portion of their harvest for other, opportunistic contracts. The intermediary must maintain some extra buffer inventory in the event a farmer decides without warning to sell elsewhere.

The intermediary sells value-added goods to the wholesaler or exporter, capturing price margins not available to the farmer. The aggregation of farmer production gives the intermediary pricing power, which can be substantial during times of supply constraint. The intermediary's ability to warehouse inventory and float accounts receivable also reduces the pressure to sell during times of high supply and low market price, instead reserving inventory for times when there is less competition.



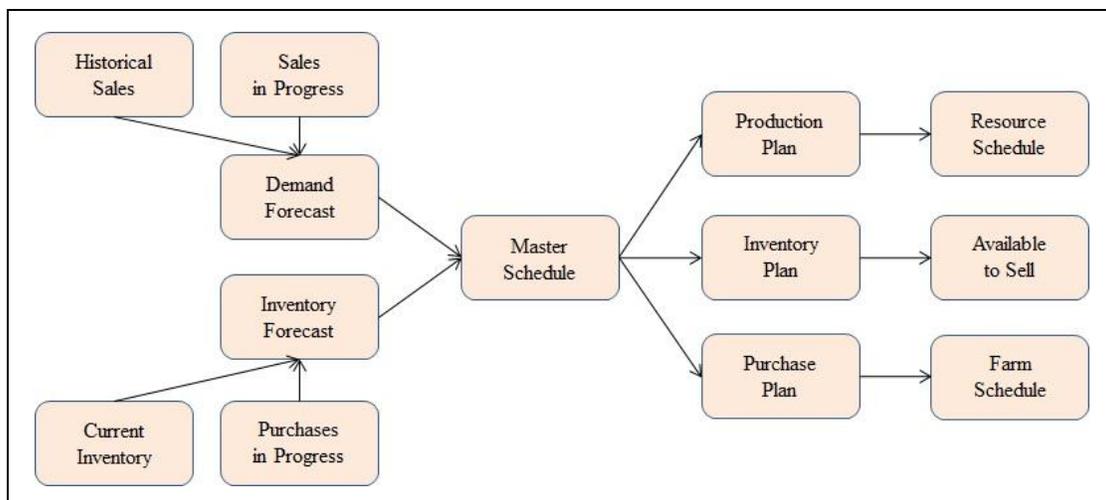
In some value chains the intermediary can only do limited processing and sell intermediate goods which other firms post-process. A good example is the sale of dried coffee beans to roasters in the US or EU. But in some cases the intermediary itself can produce a final good for consumer sale. An example would be chili sauces made from red and green chilies. In this latter case the farmer community can private-label its product for either general or boutique channels, potentially earning itself a much higher wholesale margin.

Supply chain planning

The community's intermediary becomes a key link in the supply chain, and must synchronize its production and inventory activity with trading partners further down the chain. It does so by first anticipating demand which is fulfilled from finished inventory, and then scheduling production activities and associated purchases from farmers to keep the finished inventory replenished to a level appropriate to demand variability, transportation lead times, and other factors.

Because processing can only be performed at a certain pace, the farmer harvest must be coordinated with the production schedule to avoid too much raw material inventory accumulating. This is of course difficult when there are growing seasons and crops ripen at the same time throughout the region. Sufficient inventory space is required to manage the buildup in advance of processing, and the drawdown when there is no harvest coming in.

Both customer demand management and farmer supply management are considered in the development of the supply chain plan as illustrated below. Activities are planned within discrete time periods (eg., daily, weekly, monthly) with the resulting production plan, inventory deployment plan, and harvest purchase plan specifying quantities to be produced, stored, and purchased in the same time periods. The projected finished inventory levels in each future time period defines how much product can be sold to a downstream trading partner.



In order to develop a supply chain plan, it is necessary to project future purchases by customers. This can be obtained from the customer directly, or calculated statistically from historical sales data, adjusted for expected unusual future events. The important point is that the intermediary has demand visibility further down the supply chain than the farmer, and can use inventory to balance supply and demand in any given time period. This insulates the smallholder from extreme swings in demand and price, improving planting decisions throughout the community.

It bears repeating that a single computerized spreadsheet can be used for this planning. It need not be an elaborate process, but it does require rigorous data management and some collaboration with trading partners. Executed well, the plans will maximize earnings, minimize volatility, and efficiently allocate farm production.

Trading partner management

In addition to sharing demand and supply data with trading partners in the supply chain, the community's intermediary also has the option of forward contracting sales to reduce spot price and demand volatility. Just as the farmer can withhold a portion of his harvest for opportunistic sales to other processors, so the intermediary can commit a proportion of its finished inventory to its top trading partners and reserve some for other, potentially higher-margin sales. Again, this need not require purchasing commodity futures on a London exchange. It can take the form of a simple contract and schedule agreed directly between the intermediary and its trading partners.

Trading relationships depend on reliable communications, and there are often limited options available in rural agricultural areas. Farmers rely on cell phones to transact their business, and where voice services are expensive text messages are used. It is probably most efficient to have the value chain intermediary's computer initiate text messages to the farmers notifying them of purchase schedules, while the planner responds to farmer questions via voice call.

Trade management

Globalization has turned every farmer of widely traded commodities into a potentially international supplier. His product must be managed through customs, and followed from field to store shelf. It must adhere to national standards of quality and often be certified by independent inspectors. More problematic are export barriers imposed by the host country and import tariffs levied by the customer nations. Import quotas and other tools of national policy further complicate the situation.

Responding to this ever changing environment is well beyond the capability of most farmers and their value chain intermediaries as well. But issues of traceability, packaging, and certification remain and here the intermediary can serve an important role collectively on behalf of all the community's farmers.

Toward empowered farmers

For many of the world's 1 billion rural poor, there is no hope of gaining additional market power as individual smallholders. Their communities cannot obtain the sophistication or assets in the absence of donor help. Yet the answer is not just more financial aid. This paper has suggested one mechanism for implementing value chain upgrading that empowers farmers and their communities, while ultimately reducing and even eliminating overall aid dependence. What remains is mobilization of the resources necessary to implement and then support the changes.

Fortunately this need not be overwhelming. Most of the expenditures associated with fixed assets and operations are incurred at startup, after which retained earnings supports organic growth. In many cases the conversion facility and equipment requirements are basic, labor is abundant at low cost, and host governments will provide various incentives. The author has described elsewhere financing these social business startups via donor revolving aid funds.

The largest single cost is likely to be the financing of raw material and other input purchases paid in cash, especially with highly seasonal crop production. Sales of intermediate and finished goods are more stable but customers demand terms for the best price. Thus the inventory working capital requirement is high. This can be addressed with credit lines tied to futures contracts, or bank loans guaranteed by the donor agency. It is an appropriate use of debt instruments. Over time, retained earnings will also offset the external funding requirement.

References

Coke, James. *The Social Business Revolving Aid Fund: A Tool for Economic Empowerment in Lesser Developed Countries*. 2012

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